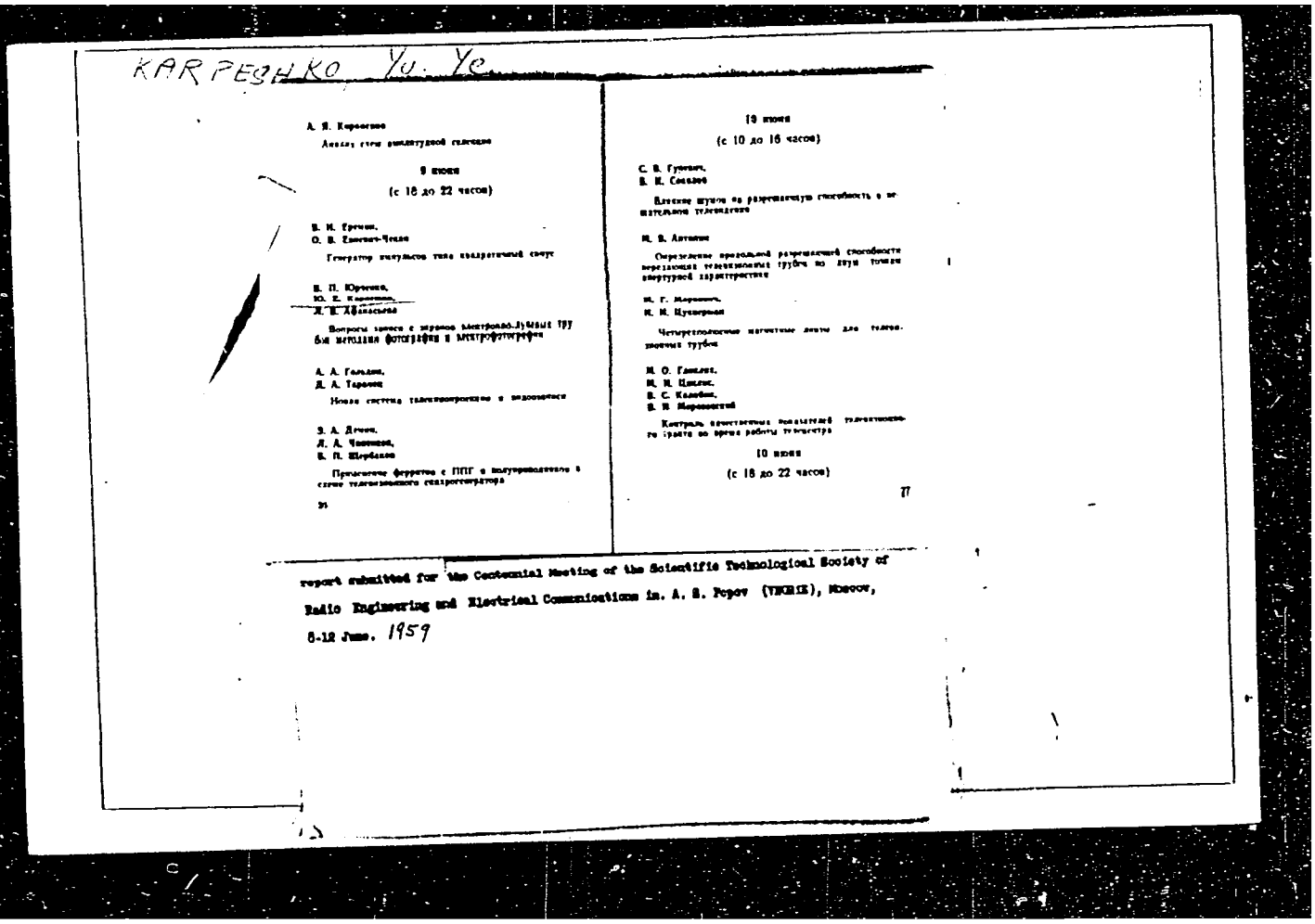

KARPENKO Yu. Ye.

А. В. Кирюшкин

Анализ схем импульсной селекции

9 июня

(с 16 до 22 часов)

В. Н. Грачев,
О. В. Ефимович-Чекан

Генератор импульсов типа квадратичный синус

В. П. Юрченко,
Ю. Е. Кириллин,
Л. В. Афанасьева

Вопросы записи с широким электронно-лучевым трубок методами фотографии и электрофотографии

А. А. Гальдин,
Л. А. Тарасов

Новая система телевизионного и радиосвязи

З. А. Дячин,
Л. А. Чижикова,
В. П. Шорбаков

Применение ферритов с ППГ в полупроводниковых в схеме телевизионного синхрогенератора

[illegible]

10 июня

(с 10 до 16 часов)

С. В. Гуревич,
В. И. Семаков

Влияние шумов на разрешающую способность в телевидении

М. В. Антонов

Определение предельной разрешающей способности передающих телевизионных трубок по двум точкам амплитудной характеристике

М. Г. Морозова,
И. И. Цукерман

Четырехполюсные магнитные линзы для телевизионных трубок

М. О. Гамбург,
М. И. Цикалюк,
В. С. Калабин,
В. И. Мордовский

Контроль качественных показателей телевизионного тракта во время работы телецентра

10 июня

(с 16 до 22 часов)

77

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNIIRE), Moscow, 8-12 June. 1959

SOV/106-59-5-8/13

AUTHOR: Karpeshko, Yu.Ye.

TITLE: Recording of Images Using Cathode Ray Tubes (Zapis' izobrazheniy pri pomoshchi elektronnoluchevykh trubok)

PERIODICAL: Elektrosvyaz', 1959, Nr 5, pp 58-62 (USSR)

ABSTRACT: The author investigates the recording characteristics of a system using a travelling beam to scan the picture and a cathode ray tube to modulate the light. An analytic expression is obtained for the characteristic for positive photographic recording on high-sensitivity photographic paper. A block diagram of the system is given in Fig 1. The image signal is applied to the control grid of the CRT (1). The sweep generator (2) provides the scanning. The image is transferred to the light-sensitive surface (4) by the optical system (3). The light-sensitive material is moved by a feed mechanism (5). With a single-line sweep by the travelling beam, a smooth feed is necessary; with a line and frame electronic sweep the feed must be in steps.

Card 1/6

Recording of Images Using Cathode Ray Tubes

When anastigmatic deflection systems are used, the spot can be considered as circular with maximum brightness at its centre. During the scan each point on the exposed surface receives a projection of the light spot, the brightness of which depends on the coordinates of the "hachure" and also on time. The illumination at any point is found by integrating the expression for the brightness (if the recording speed is high, the afterglow must also be considered). To determine the recording characteristic, i.e. the relation between the density of the blackening of the picture obtained and the modulating voltage, it is convenient to assume that there is no modulation in time. The integral brightness in a plane passing through the centre of the spot will then be given by:

$$B = 2\int_0^r B_{max}\cos^2\frac{\pi}{2r}x\,dx,$$

Card 2/6 i.e. $B = B_{max}r$.

Recording of Images Using Cathode Ray Tubes

For quantitative evaluation of the illumination of the exposed surface, the spot can be replaced by an equivalent spot having uniform distribution of the brightness. Since the total brightness must remain unchanged, the diameter of the equivalent spot will equal half the diameter of the actual spot. The illumination of an elementary area of the light-sensitive surface is determined by the brightness of the light spot on the CRT screen and by the parameters of the optical system

$$E_{av} = \frac{\pi}{4} 10^4 \frac{\left(\frac{D}{f}\right)^2}{\left(1 + \frac{1}{\beta}\right)^2} \tau(\lambda) \frac{\Delta S_{tr}}{\Delta S} B_{av}$$

where $\tau(\lambda)$ is a coefficient accounting for the loss of light in the objective; β - the linear magnification; ΔS_{tr} - the spot area on the CRT screen; ΔS - the spot area on the exposed surface; $\Delta S = K_{ras} \beta^2 \Delta S_{tr} K_{ras}$ - is a coefficient accounting for scattering of the light in

Card 3/6

the light-sensitive layer. The brightness of the cross-section of the spot on the CRT screen B_{av} is given experimentally by the relationship

$$B_{av} = A(\lambda) \frac{i_{beam}}{\Delta S_{tr}} (u_a - u_o)^{\alpha}$$

where $A(\lambda)$ is the spectral light output of the phosphor; α - a parameter characterising the phosphor and its excitation conditions. The relationship between the change in the brightness and the modulation of the signal in time depends on the modulation characteristics of the tube.

$$i_{beam} = K_{tr} (u_{mod} - u_{cut\text{-}off})^n$$

$$i_{beam} = K_{tr} \Delta u^n$$

where n usually has a value between 2.5 and 3.5. A typical characteristic is given in Fig 2. Taking the modulation characteristic into account, the average illumination depends on the modulation voltage as given

Recording of Images Using Cathode Ray Tubes

by:

$$E_{av} = K_{exp} K_{opt} K_{tr} \frac{1}{\Delta s_{tr}} \Delta u^n$$

The exposure characteristic for a single-line sweep by the travelling beam is given by

$$H = K \Delta u^n \quad \text{or} \quad \log H = n \log \Delta u + \log K$$

where K is a coefficient depending on the parameters of the recording apparatus. The recording characteristic $D_r = f(\Delta u)$ is determined as the exposure characteristic $\log H = f(\Delta u)$ or as the characteristic curve of the light sensitive material $D_r = f(\log H)$. Comparison of the calculated and experimentally-obtained curves are shown in Fig 3. Finally, the author discusses the properties of light-sensitive materials for recording either photographically or by special electro-photographic methods. In the first case, high-sensitivity photo-plates or photo-paper are used. In the second case, the recording is produced on either electro-photographic

Card 5/6

Recording of Images Using Cathode Ray Tubes

paper or on sensitive selenium plates with later transfer to the usual paper. For a given recording speed, the exposure can be increased either by increasing the brightness of the light spot on the CRT or by improving the parameters of the optical system. Increasing the beam current beyond a certain value is undesirable due to loss in resolving power. The most convenient method is to use phosphors with high light outputs and an optical system with minimum light loss. Comparison is made between recording by the travelling beam method and by the usual sensitometric methods. There are 3 figures and 3 references, 2 of which are Soviet and 1 English.

SUBMITTED: 7th July 1958

KARPESHKO, Yu. Ye.
p. 2

SOV/77-4-2-15/18

23(4) 23 (5)

AUTHOR: Lyalikov, K.S.

TITLE: Successes of Soviet Electrophotography (Uspekhi sovetskoy elektrofotografii) A Scientific and Technical Conference on Questions of Electrography (Nauchno-tekhnicheskaya konferentsiya po voprosam elektrografii)

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1959, Vol 4, Nr 2, pp 149-152 (USSR)

ABSTRACT: This is an account of a scientific and technical conference on electrography, the first to be held in the Soviet Union and evidently in the world. It was organized in Vil'nyus on December 16-19, 1958 by the Sovet narodnogo khozyaystva Litovskoy SSR (Council for National Economy of the Lithuanian SSR), the Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta ministrov Litovskoy SSR (State Scientific and Technical Committee of the Council of Ministers of the Lithuanian SSR) and the Nauchno-issledovatel'skiy institut elektrografii (Scientific Research Institute of Electrography). The conference, attended by over 300 scientific workers, was opened by the Deputy Chairman of the Council for National Economy of the Lithuanian SSR P.A. Kul'vets, after which the director of the Institute for Electrography, I.I. Zhilevich, reviewed the state and prospects for development of electrography in the USSR. He stated that research in this field should be carried out along the following lines: a) a search for new photo-active materials with high dark resitance; b) physical research into the internal photoeffect; c) development of photosemiconductor layers; d) development of the theory of the electrophotographic process. K.S. Lyalikov (speaking also for O.G. Popova) gave a report in which he suggested determining the light sensitivity of electrophotographic layers in GOST units. N.Z. Plavina (speaking also for I.I. Zhilevich, L.I. Kryun'ko, N.N. Markevich, B.I. Kalinauskene and O.M. Suveyzdis) reported on some research on the sensitization of a semiconductor in electrophotographic layers. V.M. Fridkin gave a report on highly sensitive electrophotographic layers and an electrophotocopying device, and reviewed the formation process of the latent electrophotographic image on the basis of the zonal theory. He also described the design of an electrosensitometer for determining sensitivity by the relaxation period of a charge on the surface of the layer, and the circuit of an electrophotographic copying device. Anfilov finished describing the latter and then spoke on the mechanics and kinetics of the development of the latent electrophotographic image in liquid developers.

Card 3/10

SOV/77-4-2-15/18

Successes of Soviet Electrophotography; A Scientific and Technical Conference on Questions of Electrography

K.M. Vinogradov described some of the features of the cascade and liquid methods of electrophotographic development. Yu.Ye. Karpeshko devoted his report to the criterion of light sensitivity of the elctrophotographic process. After the reports, a discussion took place on methods of determining the light sensitivity of electrophotographic layers. A.N. Chernyshev spoke on the prospects of developing polygraphic processes using electric and magnetic forces. O.V. Gromov (speaking also for I.I. Zhilevich, A.A. Sukhiy, V.A. Gordeyeva, A.S. Pauzha and Yu. I. Kevalaytis) reported on the development of elctrophotographic reproducing equipment. A.S. Pauzha (speaking also for I.I. Zhilevich, A.S. Borisovich, M.M. Gal'vidika and M.I.Rautkauskas) reported on the use of electrographic methods in recording oscillographs and other recording instruments. V.P. Yurchenko (speaking also for L.N.Balin) spoke on the possibility of electrophotographically recording images from electron-beam tubes. L.S. Korol' (speaking also for M.M. Markevich, T.I. Kozlovskaya, B.I. Kalinauskene, M.K. Naynens, I.I. Zhilevich and E.A. Montrimas) gave a detailed description of laboratory and machine methods of producing photosemiconductor papers (zinc oxide was used). A.A. Sukhiy (speaking also for I.I. Zhilevich, O.V. Gromov, V.A. Gordeyev , N.V. Fedotov and T.N. Ger) described a laboratory and industrial machine for producing photosemiconductor papers. T.A. Shishkina (speaking also for Ya.A. Oksman) reported on a method of examining electrophotographic materials using an a/c bridge. S.I. Khotyanovich (speaking also for A.I. Gikens and I.S. Shilevkens) spoke on developing materials for electrophotography and ferromagnitography, including developers giving a "reverse" image. B.I. Tikhonov reviewed methods of measuring the electrostatic potentials of electrophotographic layers, stressing that the oscillating electrode should not be placed above a layer with varying potential as this causes self-discharge. B.V. Erukovskis (speaking also for R.S.Gorevoy, A.A.Osipov and Ye. S. Kheyfets) spoke on the practice of producing velveteen papers in an electrostatic field, and showed samples produced by the Grigishskaya paper factory. Ye.L. Nemirovskiy then gave a historical review of the development of electrographic methods in which he paid tribute to the work of the Scientific Research Institute of Electrography in Vil'nyus and the Institut poligraficheskogo mashinostroyeniya (Moskva)-(Polygraphic Machine-Building Institute (Moscow)). Debates were then held

Card 6/10

on methods of measuring the potential of charged electrophotographic layers, the vibration pick-up most-used was shown in B.I. Tikhonov's report to be not always accurate. S.G.Grenishin stated that the bad influence of the oscillating electrode can be eliminated if the electrode probe above its surface is fixed and the pick-up is connected to it by a shielded cable. In the debate on Ye.L. Nemirovskiy's report it was stated that the research of Academicians A.N. Terenin and Ye.K. Putseyko should be considered as the basis of all work on electrophotographic papers with ZnO, as they were the first to show the possibility of optical sensitization of the internal photoeffect in ZnO. N.M.Gol'vidis then gave a report on the depositing of charges by a corona discharge. A.I. Kaminskas and A.P. Yanulis reviewed some of the results of the use of electrographic methods in radiography. L.I. Nyun'ko (speaking also for I.I. Zhilevich, I.Z. Plavin, Yu.K. Vishchakas and Yu.A.Zibuts) reported on relaxation processes in semiconductor layers, using a vibration electrometer. Yu.K.Vishakas gave a report on research on some physical properties of the polycrystalline layers of selenious cadmium. M.P. Mikalkyavichyus spoke on some of the photoelectric properties of Sb_2S_3 and Sb_2Se_3: the absorption maximum of the latter is about 900 m μ. S.M. Herman reported on methods of obtaining selenium light-sensitive layers, including sublimation and thermal treatment; it was also found that the sensitivity of the layers increased after storage for 1.5 to 2 months at room temperature. P.M. Podvigalkin (speaking also for S.G.Grenishin) spoke on research into the electrical properties of electrophotographic layers of amorphous selenium and powdered zinc oxide. N.K. Shiktorov (speaking also for A.S. Tauraytis) discussed the production of selenium layers and some of their properties. Finally the following reports on ferromagnetography were delivered; 1) B.Ya. Kaznacheyev, V.M.Zhogina, "Electrodeposition of Magneto-Hard Alloys with Given Magnetic Characteristics" 2) M.T.Arutyunov, "Visualization of Magnetic Oscillograms by the Ferrographic Method" 3) V.P.Patrunov, "Ferrographic Recording of Facsimile Images" 4) I.I.Zhilevich, I.I. Sikis, B. Ye. Buchek, I.I. Naynise, A.K.Kirhis, "Mock Experiments in Non-Pressure Ferromagnetic Printing". There was also an exhibition showing the work of the Electrographic Institute. The most important conclusion of the conference was that a solid approach had been made to the possibility of wide technical use of the methods of electrography. It was considered that although work in this field actually started only in 1955-56 it has covered as much ground as the USA in 10 years. While admitting that it was easier to reproduce results already achieved than to be the first to arrive at them, the conference observed that the Americans took good care that no important information appeared in the literature available.

Card 10/10

ACCESSION NR: AP3009755 S/0187/63/000/010/0045/0046

AUTHOR: Karpeshko, Yu. Ye.

TITLE: Photoelectric characteristics of selenium films exposed to the screen of a cathode-ray tube

SOURCE: Tekhnika kino i televideniya, no. 10, 1963, 45-46

TOPIC TAGS: photoelectric characteristic, selenium film, cathode-ray tube, 18LK9A tube, FSR-4 sensitometer

ABSTRACT: Se films 20- and 40-micron thick sprayed onto an aluminum backing and Se films 15- and 30-micron thick as well as Se-Te films sprayed onto a brass backing were exposed to an 18LK9A cathode-ray scanning-beam tube and also to an incandescent lamp (part of an FSR-4 sensitometer) with a color temperature of 2,840C. The best results (the steepest characteristic) were obtained with the 15-micron Se film sprayed on the brass backing at 65C exposed to the 18LK9A

Card 1/2

ACCESSION NR: AP3009755

tube and with the 30-micron film exposed to the lamp. The same thin Se film proved to be best in recording experiments with a beam current of 7 microamp or lower and an aniline-yellow-tinted iditol developer. Orig. art. has: 1 figure.

ASSOCIATION: none

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SUB CODE: PG	NO REF SOV: 002	OTHER: 000

Card 2/2

KARPESHKO, Yu.Ye.

Dynamic light characteristics of concentrated-arc lamps. Elektrosviaz' 18 no.12:77-79 D '64. (MIRA 18:1)

AFANAS'YEVA, Lyudmila Vasil'yevna; KARPESHKO, Yuriy Yefimovich; BOGORODSKIY, G.N., otv. red.; BATRAKOVA, T.A., red.

[Electrophotographic recording of images] Elektrofotograficheskaia zapis' izobrazhenii. Moskva, Sviaz', 1965. 46 p. (MIRA 18:5)

KARPETA, D. I.

RYABTSEV, L.N.; KARPETA, D.I.; MOREV, I.I.; RAYEV, Yu.O.; KLOKOV, P.V.; ZHEMBUS, M.D.; YEVSEYEV, A.M.; TKACHENKO, V.K.

Young blast furnace operators are exchanging work practices. Metallurg no.12:7-10 D '56. (MIRA 10:1)

1. Master domennoy pechi no.7 Magnitogorskogo metallurgicheskogo kombinata (for Ryabtsev). 2. Master domennoy pechi no.7 Magnitogorskogo metallurgicheskogo kombinata (for Karpeta). 3. Master Magnitogorskogo metallurgicheskogo kombinata (for Morev). 4. Pomoshchnik mastera Kuznetskogo metallurgicheskogo kombinata (for Rayev). 5. Master metallurgicheskogo zavoda imeni Serova (for Klokov). 6. Master metallurgicheskogo zavoda imeni Petrovskogo (for Zhembus). 7. Master Chusovskogo metallurgicheskogo zavoda (for Yevseyev). 8. Master Makeyevskogo metallurgicheskogo zavoda (for Tkachenko).

(Magnitogorsk--Blast furnaces)

KARPETA, E., inz.

Achievements in the gallery dribing at the CSA mine in Karvina.
Uhli 6 no.3:83-86 Mr'64

1. Dul CSA, Karvina

KARPETA, Erich, inz.

Experiences in the organization and preparation of production at the CSA Mine. Uhli 7 no.1:2-6 '65.

1. CSA Mine.

NEYMAN, M.B.; LIKHTENSHTEYN, G.I.; KONSTANTINOV, Yu.S.; KARPETS, N.P.; URMAN, Ya.G.

Thermal oxidative degradation of polypropylene studied by the method of nuclear magnetic resonance. Vysokom.soed. 5 no.11: 1706-1710 N '63. (MIRA 17:1)

1. Institut khimicheskoy fiziki AN SSSR.

9.2571

77781
SOV/109-5-2-14/26

AUTHORS: Tychinskiy, V. P., Derkach, Yu. T., Karpetskiy, V. V.

TITLE: Experimental Investigation of Ferrite Amplifier

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 2, pp 288-295 (USSR)

ABSTRACT: The subject of the present article is a report on tests of a ferrite amplifier (similar to the one M. T. Weiss, was using (see reference end of abstract) under a degenerate electromagnetic regime. A block diagram of the installation is shown in Fig. 1. A magnetron was used as a power supply for excitation, the power level of which was controlled by a thermistor bridge. Its signal was used by the sem-automatic recorder of the power absorption spectrum in the ferrite at excitation frequency. A pulse klyston oscillator was the source of the amplified pulse signal. The relations measured during the tuning of the ferromagnetic amplifier are shown in Fig. 2.

Card 1/1

Experimental Investigation of Ferrite Amplifier 77781
SOV/109-5-2-14/26

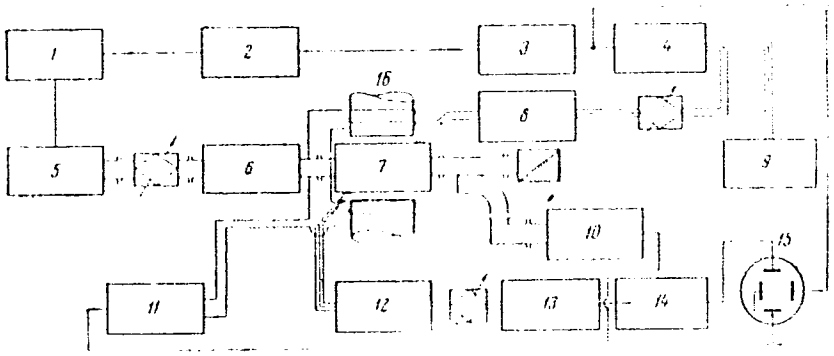
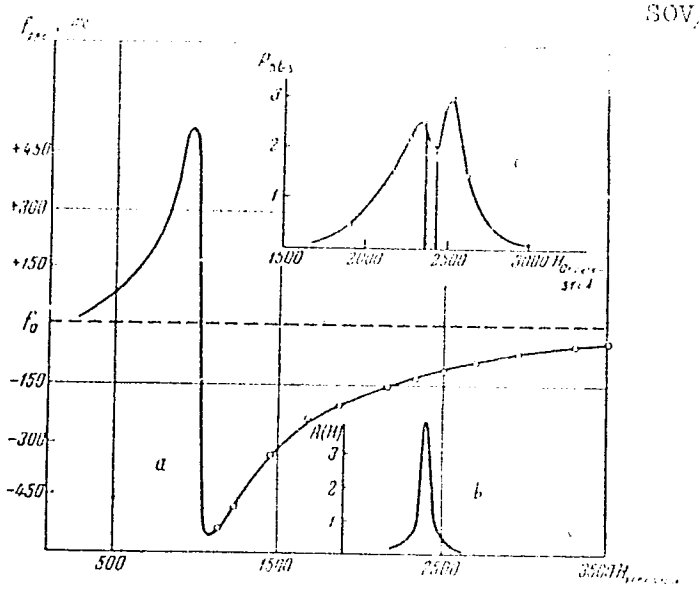


Fig. 1

Card 2/15 See card 3/15 for caption

Caption to Fig. 1. Block diagram of measuring installation: (1) modulator; (2) pulse generator; (3) pulse generator; (4) klystron block; (5) magnetron; (6) meter; (7) ferrite amplifier; (8) measuring circuit; (9) spectrum analyzer; (10) power meter; (11) semi-automatic recorder; (12) low frequency filter; (13) detector; (14) broad band amplifier; (15) oscillograph; (16) electromagnet.

Experimental Investigation of Ferrite Amplifier 77731
SOV/109-5-2-14/20



Card 4/15 Fig. 2. See card 5/ For caption

Experimental Investigation of Power Amplifier [illegible]
Approved For Release 2000/06/13 : CIA-RDP86-00513R000720820015-6

Fig. 2. (caption) Diagram of M.P system loading of ferrite amplifier: (a) P_{in} at load resonator versus magnetic field H_0; (b) typical curve of load resonator at signal frequency; (c) curve of power absorption at excitation frequency.

The relation $f_m = f(P_{per}, (H_0))$ was established with the aid of a spectrum analyzer. For a more effective excitation of the amplifier by the magnetron, a slight [illegible] absorption in the system of the excitation frequency was required. Typical curves are given in Fig. 2 and 3.

Card 2/

Experimental Investigation of Ferrite Amplifier

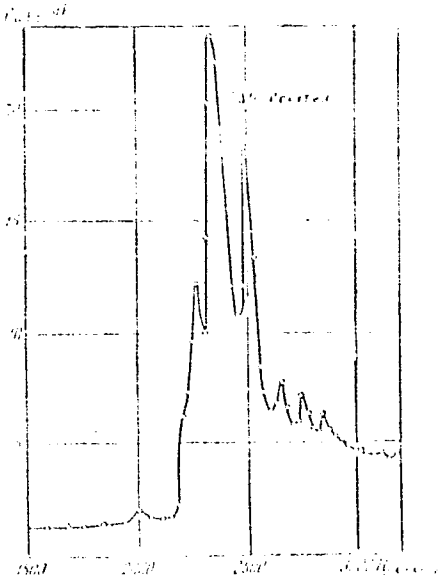


Fig. 4. Curve of power absorption by ferrite at variable frequency (dBm/mW level).

Experimental Investigation of Ferrite Amplifier 77761
SOV/109-5-3-14/26

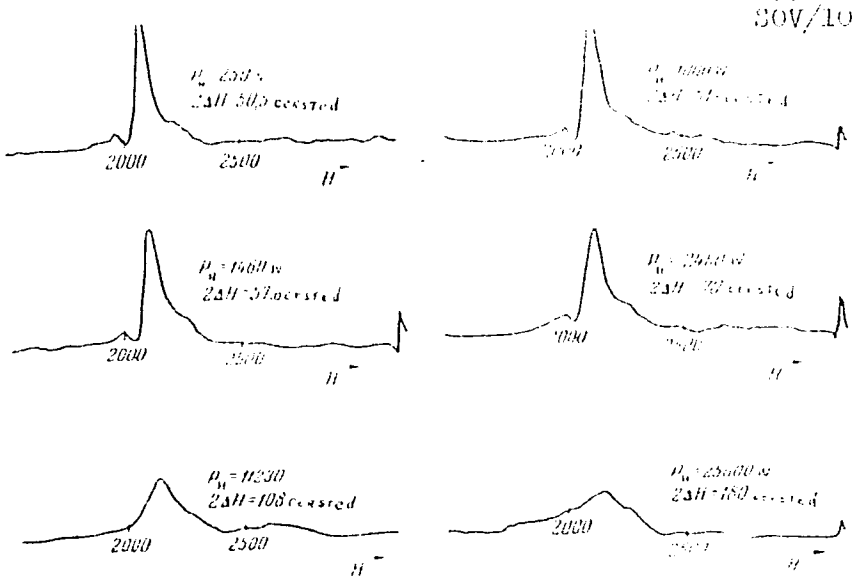


Fig. 5.

Card 7/15 See caption on card 8/15 for Fig. 5.

Caption to Fig. 5.

Fig. 5. Curves of power absorption by ferrite at excitation frequency (magnetron level) (disc 3.8 x 1mm).

It was expected that there would be no noticeable increase in precession angle of magnetization. The experiment proved the opposite. A typical graph (see Fig. 7) shows that precession angle θ calculated according to equation

$$\theta = \frac{h}{2\Delta H} \simeq \frac{0{,}103\sqrt{P}}{2\Delta H},$$

increases by 2.5 times above the threshold. This permitted a selection of the working point of the power amplifier considerably above the threshold where the resonance curve starts widening. This lowers the demands from the ferrite element.

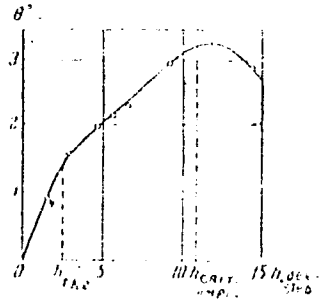


Fig. 7. Saturation of the precession angle θ of ferrite magnetization.

The pulse from the klystron oscillator passing at the time of a powerful magnetron pulse showed a flare as it appears in Fig. 8.

Card 5/15

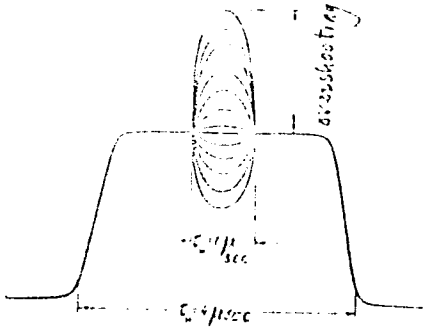


Fig. 8. Pulse of amplified signal on oscillograph screen.

It was found that this flare is not due to tuning or direct passage of excitation power, but is a pulse at signal frequency f_c. The amplification coefficient was measured, and at a 3 db level its dependence on excitation power is shown on Fig. 9. The parametric character of ferrite amplifier was proven by the

following test

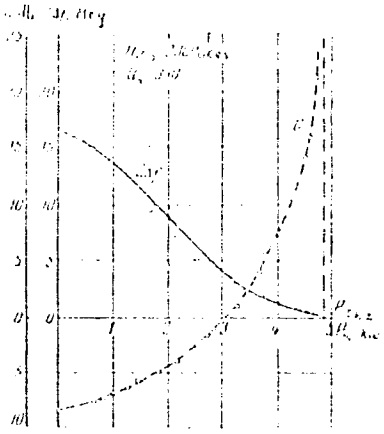


Fig. 9. Amplification, G, and bandwidth $2\Delta f$ versus excitation power P_{excit}.

Experimental Investigation of Ferrite Amplifier

77781
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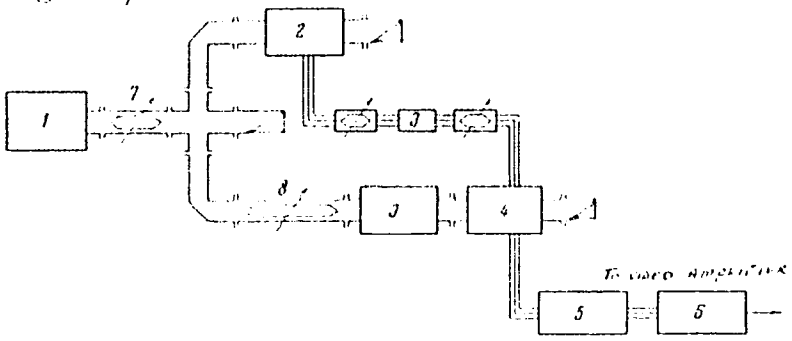
One of the ferrite amplifiers was operated as an oscillator and was used as a signal pulse source at frequency $f_{\pi}/2$ synchronized with the magnetron. The second device was fed by the same magnetron, underexcited and operated as an amplifier of the first device (see Fig. 11).



Card 12/15

Fig. 11. See card 13/15 for caption.

Experimental Investigation of Ferrite Amplifier

Caption to Fig. 11.

Fig. 11. Block diagram of [illegible] phase relations: (1) magnetron; (2) [illegible]; (3) phase shifter; (4) ferrite [illegible]; (5) [illegible]; (6) detector; (7, 8) attenuators.

When phase φ of the amplifier signal [illegible] amplifier input, a periodic change [illegible] was observed. A similar dependence was observed [illegible] the change of signal excitation [illegible]. This corresponds the parametric theory of ferrite amplifiers. The conclusions: (1) Ferrite amplifiers [illegible] type have a relatively narrow [illegible] decreasing with an increased [illegible]

Card 13/15

Experimental Investigation of Ferrite Amplifier

[illegible] relatively high circulated power. A conditions regime may be [illegible] cooling. (3) The amplifier [illegible] ($P_{...}$ $P_{...}/2$) is [illegible]. A [illegible] operation [illegible] electromagnetic [illegible] conditions exist. (4) The parametric theory of ferrite [illegible] admits in principle an operation [illegible] frequency lower than that of the [illegible] when n>2; however, this requires [illegible] crease in excitation power and is impractical. A. Popova supplied ferrite monocrystals. There are 11 figures; and 12 U.S. References. U.S. references are: M. T. W[illegible], A Microwave Amplifier and Oscillator, J. Appl Phys., 1957, 107, 1, 317; [illegible], Solid State Amplifier and Oscillator, Appl. Phys., 1958, 29, 3, 471; W. [illegible],

Card 14/15

Experimental Investigation of Ferrite Amplifier

77781
SOV/109-4-8-14/26

Wang, Phase Dependence of Ferromagnetic Microwave Amplifier, Proc. IRE, 1956, 46, 9, 1677; A. D. Berk, L. Kleinmann, E. E. Nelson, Modified Semistable Ferrite Amplifier, I.E Convention Rec., 1957, 2, August, ?; H. Heffner, K. Kotzebue, Experimental Characteristics of a Microwave Parametric Amplifier Using a Semiconductor Diode, Proc. IRE, 1958 46, 6, 1301.

SUBMITTED: April 16, 1959

Card 15/15

S/109/60/005/04/021/028
E140/E435

9.4000

AUTHORS: Tychinskiy, V.P. and Karpetskiy, V.V.

TITLE: Investigation of a Single-Tuned Parametric Amplifier

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4, pp 679-681 (USSR)

ABSTRACT: The note describes certain experimental characteristics of a single-tuned parametric amplifier operating at wavelength shorter than 10 cm. Gain factor as a function of excitation power, frequency variation of noise factor, threshold excitation power and gain factor, noise factor as a function of threshold excitation factor and gain factor in dependence on input power were measured. Acknowledgements are expressed to Yu.T.Derkach for his assistance in evaluating the results. There are 4 figures and 5 references, 2 of which are Soviet and 3 English.

SUBMITTED: August 17, 1959

Card 1/1

80584

9.2571

S/109/60/005/06/009/021
E140/E163

AUTHORS: Tychinskiy, V.P., Derkach, Yu.T., and Karpetskiy, V.V.

TITLE: Experimental Investigation of the Degenerate Regime of a Ferrite Amplifier

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 6, pp 943-954 (USSR)

ABSTRACT: The theory developed by Mandel'shtam, Papaleksi, Divil'kovskiy and Rytov is employed to describe the characteristics of a ferrite amplifier in the degenerate electromagnetic regime. Such an amplifier was proposed by Suhl (Refs 1-3) and constructed by Weiss (Ref 7). At no time did Weiss and others compare the experimental results with the theoretical predictions. Suhl's quasi-linear theory neglects the effect of higher order non-linear magnetisation terms on the amplifier operation and neglects the phase relations between the amplified signal and the excitation, which are essential for the degenerate electromagnetic regime. This analysis is the purpose of the present article. The experimental system permitted the exact realisation of the condition that the pumping frequency is twice the signal frequency.

Card 1/3

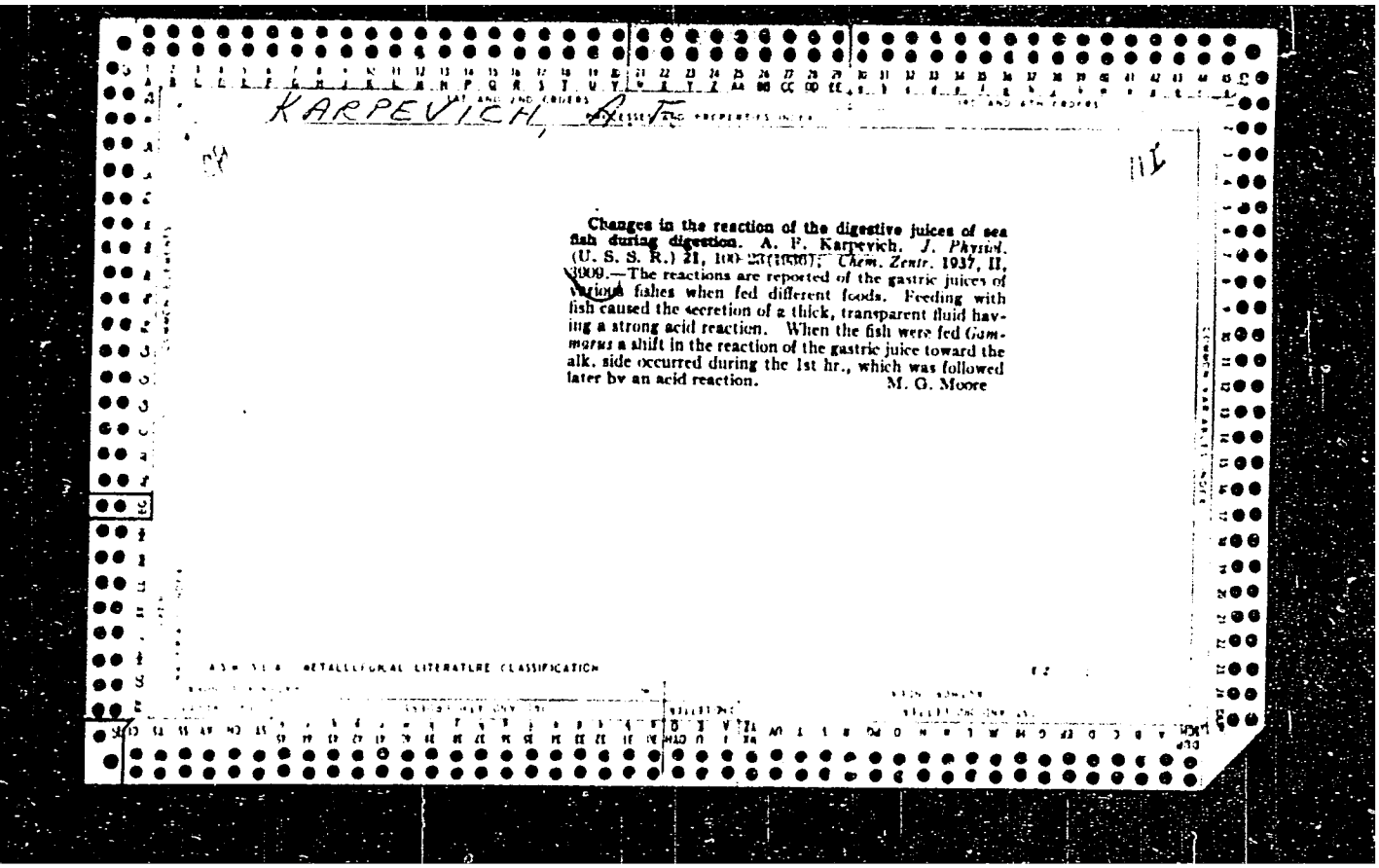
80584

S/109/60/005/06/009/021
E140/E163

Experimental Investigation of the Degenerate Regime of a Ferrite Amplifier

The following partially inter-related questions were studied: determination of the oscillation threshold of the ferrite amplifier and its dependence on the loaded Q of the resonator; the dependence of gain on the excitation power at the most favorable and least favorable phases for operation in reflection; the dependence of amplification and bandwidth on excitation power at random phase in operation in transmission; the dependence of amplification on the phase angle in transmission; comparison of the transmission and reflection loads of the amplifier. Generally good agreement between experimental and theoretical values is obtained, except in the neighbourhood of limiting values of VSWR where parasitic reflections, losses and other forms of non-idealness of the measurement channel have substantial influence. Certain higher-order non-linear effects, outside the scope of the quasi-linear ferrite amplifier theory are noted. At excitation powers somewhat lower than threshold weak oscillations begin. The finite amplitude of oscillation indicates the

Card 2/3



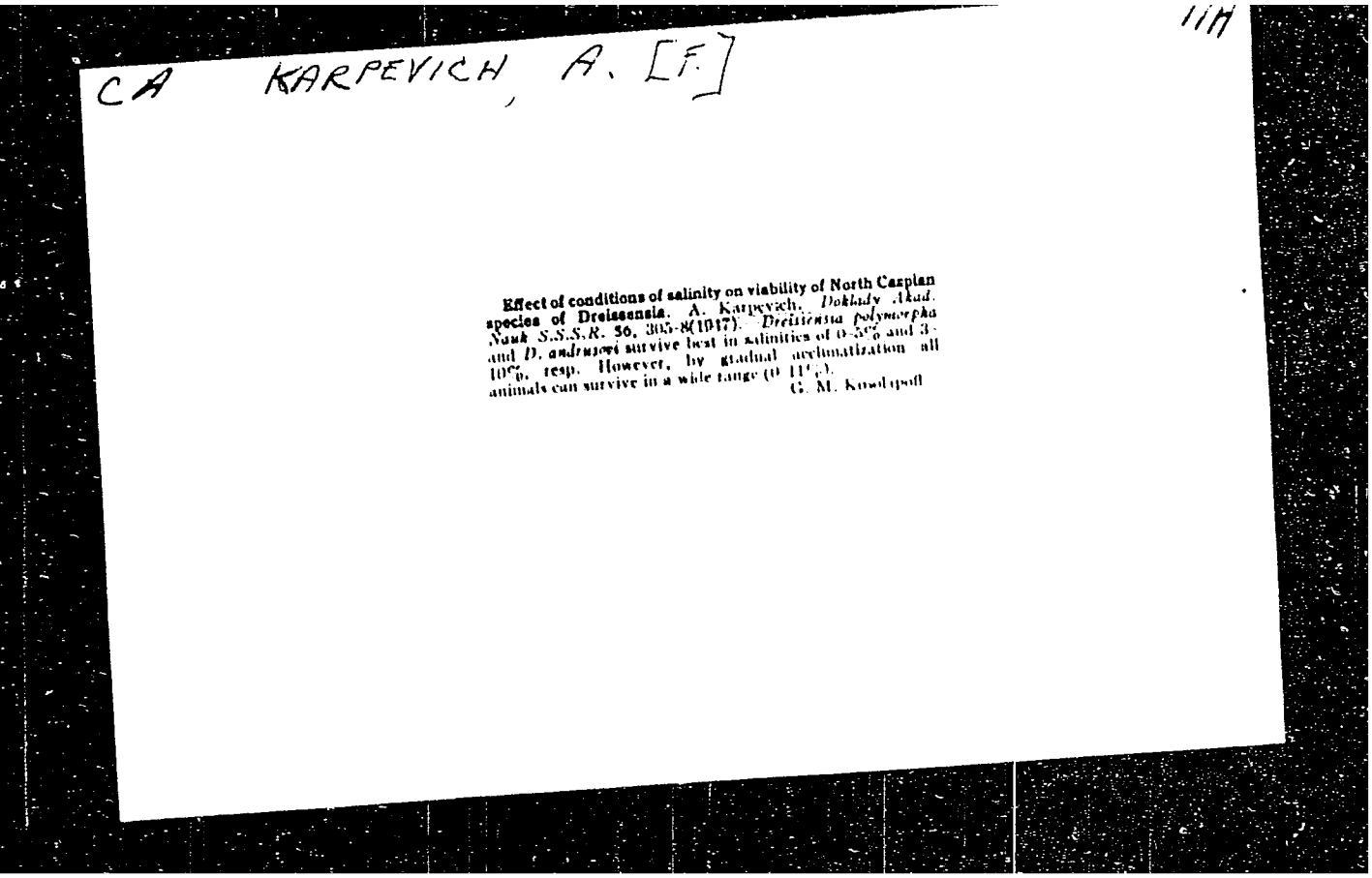
KARPEVICH, A. F.

Changes in the reaction of the digestive juices of sea fish during digestion. A. F. Karpevich. *J. Physiol.* (U. S. S. R.) 21, 100-23(1936); *Chem. Zentr.* 1937, II, 3009.—The reactions are reported of the gastric juices of various fishes when fed different foods. Feeding with fish caused the secretion of a thick, transparent fluid having a strong acid reaction. When the fish were fed *Gammarus* a shift in the reaction of the gastric juice toward the alk. side occurred during the 1st hr., which was followed later by an acid reaction. M. G. Moore

METALLURGICAL LITERATURE CLASSIFICATION

KARPEVICH, A. F.

"Response of Certain Species of the Family Cardidae to the Salinities of the North Caspian Sea," Dokl. AN SSSR, 54, No.1, 1946



CA KARPEVICH, A. [F.]

IIM

Effect of conditions of salinity on viability of North Caspian species of Dreissensia. A. Karpevich. *Doklady Akad. Nauk S.S.S.R.* 56, 305-8(1947). *Dreissensia polymorpha* and *D. andrusowi* survive best in salinities of 0-5‰ and 3-10‰, resp. However, by gradual acclimatization all animals can survive in a wide range (0-11‰).
G. M. Kosolapoff

KARPEVICH, A.F.; OSADCHIKH, F.V.

Effect of the salinity and oxygen content of water and nature of the ground on Nereis succinea. Mat. k pozn. fauny i flory SSSR. Otd. zool. no.33:352-365 '52. (MLRA 10:9)
(Caspian Sea--Polychaeta) (Azov, Sea of--Polychaeta)

KAZHEVICH, A. V.

"The Relation of Bivalve Mollusks of the Caspian and Aral Seas to Changes in the Salinity of Their Surroundings." Dr Biol Sci, Moscow State U, Moscow, 1953. (VZhBiol, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13) SO: Sum. 508, 20 Jul 55

KARPEVICH, A. F.

[illegible] and Inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years [illegible] and [illegible]. ([illegible], Moscow, [illegible], [illegible] Feb - [illegible] Apr [illegible])

Name	Title of Work	Nominated by
Zenkevich, L. A. Birshteyn, Ya. A. Karpevich, A. F. Yablonskaya, Ye. A. Belyayev, G. M. Spasskiy, N. N. Uzheva, I. G.	"Acclimatization of Nereis in the Caspian Sea"	Ministry of the Food Products Industry USSR

[illegible]

KARPEVICH, A.F.

KARZINKIN,G.S.; KARPEVICH,A.F.

Tasks of hydrobiology in the realm of the development of fishing in basins of the southern waters of the U.S.S.R. Vop.ikht.no.3:9-20 '55.
(Fisheries) (MLRA 8:11)

KARPEVICH, A.F., doktor biologicheskikh nauk.

Ecological principles for predicting changes in the range and composition of the ichthyofauna as the Sea of Azov becomes more salty. Trudy VNIRO 31 no.2:3-84 '55. (MLRA 9:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morlovstva i okeanografii.
(Azov, Sea of--Fishes)

KARPEVICH, A.F., doktor biol.nauk

Reaction of the invertebrates of the Sea of Azov to salinity variations. Trudy VNIRO 31:240-275 '55. (MIRA 11:6)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii.
(Azov, Sea of--Marine fauna)

KARPEVICH, A.F.

KARPEVICH, A.F.

Some data on changes in forms of bivalvular mollusks. Zool.zhur.34 no.1:46-67 Ja-F '55. (MIRA 8:3)

1. Laboratoriya gidobiologii VNIRO.
(Lamellibranchiata)

AUTHOR: Karpevich, A.F., Doctor of Biological Sciences

SOV/26-58-1-4/36

TITLE: The Present and Future of the Azov Sea (Nastoyashcheye i budushcheye Azovskogo morya)

PERIODICAL: Priroda, 1958, Nr 1, pp 26-31 (USSR)

ABSTRACT: The Sea of Azov is second in fish yield only to the Caspian Sea. But this may change due to the hydrotechnical constructions on the Don and, in the future, Kuban rivers. This mainly affects the most valuable fish of the old migration species that return, as a rule, to their parent fresh-water streams to spawn and reproduce. The spawning beds are usually far away from the river mouths, and the fish must cover great distances in both directions. Now their paths have become obstructed, while the beds of the fish spawning closer to the river mouths have been reduced in area. Thus the catches of pike-perch, bream and other fish are 3 to 7 times less than they were between 1932 and 1936. In the past year river water pollution by chemical and metallurgical plants and oil refineries exerted another negative influence on the fish propagation. In spring 1952, twenty-two cubic km of Don water, i.e. almost the entire annual run-off amount, were held back for the Tsimlyansk reservoir. Six and one half cubic km of Don water

Card 1/3

are needed for irrigation purposes and lock operation every year. This results in increased salinity of the Sea of Azov. Less valuable mineral and organic substances are washed into the sea (Fig. 2). This, too, lessens both amount and quality of fish catches, since the seasonal rhythm of the cycle of substances is broken. The amount of phytoplankton decreased 2 to 3 times and its food value diminished because of the increasing salinity of the sea. This situation was aggravated by unfavorable meteorological circumstances of recent years. It may be changed to some extent by very rainy seasonal periods. A different regulation of the water supply for the Tsimlyansk reservoir, considering the life cycle of the fish, could become a step forward. To reach the estimated possible amount of 3 to 4 times more pike-perch and 5 to 10 times more sturgeons, piscicultural enterprises must be brought into being. A still higher salination of the Sea of Azov would diminish former valuable species which then might be found only in the Taganrog Bay, while fish from the Black Sea would invade the Sea of Azov more and more. This danger could be eliminated by a restriction of the water exchange of the two seas. In any case, strict catching regulations must be enforced immediately. Restrictions concerning pike-perch,

sturgeon and bream are absolutely necessary. At present the All-Union Scientific Research Institute of Sea Fish Economy and Oceanography is engaged in investigations on changes in the seas, fish-rearing and restoration of former fish distribution. There are 2 graphs and 1 set of charts.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva (All-Union Scientific Research Institute of Sea Fish Economy and Oceanography, Moscow)

KARPEVICH, A.F.

Oxygen consumption of marine fishes as related to their physical condition. Vop. ikht. no.10:131-138 '58. (MIRA 11:10)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii.
(Fishes--Physiology) (Respiration)

KARPEVICH, A.F.

Survival, reproduction, and respiration of the mysid Mesomysis kowalevskiy (Paramysis lacustris kowalevskyi Czern.) in the brackish waters of the U.S.S.R; ecologico-physiological foundation of the acclimatization of mysids in the Aral Sea, Baltic Sea, and Lake Balkhash [with summary in English]. Zool. zhur. 37 no.8:1121-1135 Ag '58. (MIRA 11:9)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut rybnogo khozyaystva i okeanografii, Moskva.
(Schizopoda) (Salinity)

KARPEVICH,A.F., doktor biolog.nauk; BOKOVA,Ye.N., kand.biolog. nauk.; KOROBOCHKINA,Z.S., red.; FORMALINA,Ye.A., tekhn.red.

[Methods of transporting aquatic invertebrates and fish larvae for acclimatization purposes] Metody perevozki vodnykh bezpozvonochnykh i lichinok ryb v tseliakh ikh akklimatizatsii. Moskva, 1960. 55 p.

(MIRA 14:5)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii. 2. Vsesoyuznyy nauchnyy institut morskogo rybnogo khozyaystva i okeanografii (for Karpevich, Bokova)
(Invertebrates--Transportation) (Fishes--Transportation)

KARPEVICH, A.F.

Hardiness of some fishes and invertebrates during changes in the environmental salinity and methods for its determination. Trudy Karad. biol. sta. no.16:86-131 '60. (MIRA 13:9)
(HYDROBIOLOGICAL RESEARCH) (SALINITY)

KARPEVICH, A.F., doktor biologicheskikh nauk

Theoretical prerequisites for the acclimatization of aquatic organisms. Trudy VNIRO 43:9-30 '60. (MIRA 13:9)
(Hydrobiology) (Acclimatization)

KARPEVICH, A.F., doktor biologicheskikh nauk

Factors governing the acclimatization of acquatic organisms in the Aral Sea. Trudy VNIRO 43:76-114 '60. (MIRA 13:9)
(Aral Sea--Fresh-water fauna)
(Acclimatization)

KARPEVICH, A.F., doktor biologicheskikh nauk

Bioecological characteristics of the mollusk Monodacna colorata (Eichwald) in the Taganrog Gulf. TrudyVNIRO 43:244-256 '60. (MIRA 13:9)

(Taganrog Gulf--Lamellibranchiata)

KARPEVICH, A.F.; BOKOVA, Ye.N.

Transplantation of fishes and aquatic invertebrates performed in the U.S.S.R. during 1957-1959. Vop. ikht. 1 no.3:552-563 '61. (MIRA 14:11)

(Animal introduction)
(Fishes) (Invertebrates)

KARPEVICH, A.F.

Adaptive nature of the morphology of spermatozoa and eggs in bivalvular mollusks. Zool. zhur. 40 no.3:340-350 Mr '61.
(MIRA 14:3)

1. All-Union Research Institute of Marine Fisheries and Oceanography, Moscow.
(Lamellibranchiata) (Spermatozoa)(Ovum)

KARPEVICH, A.F.

Effect of abiotic and biotic factors of the medium on the acclimatization of aquatic organisms. Vop. ekol. 4:32-34 '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva.
(Hydrobiology) (Acclimatization)

KARPEVICH, A.F.

Acclimatization of fishes and invertebrates. Zool.zhur. 41 no.7:969-985 Jl '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva.
(Animal introduction) (Fishes) (Invertebrates)

KARPEVICH, A.F., doktor biolog.nauk; MIKHAYLOV, B.N.

Shrimps and spiny lobsters in the Kerch Strait. Priroda 51 no.10:120-121 O '62. (MIRA 15:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva (for Karpevich). 2. Azovo-Chernomorskiy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Kerch' (for Mikhaylov).

KARPEVICH, A.F.

Effect of water with increased calcium content on the mollusks of the Sea of Azov; materials on the acclimatization of Syndesmya ovata and Corbulomya maeotica in the Aral Sea. Trudy Gidrobiol. ob-va 12:42-54 '62. (MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva.
(Aral Sea—Lamellibranchiata)
(Azov, Sea of—Lamellibranchiata)
(Animal introduction)

KARPEVICH, A.F.; BOKOVA, Ye.N.

Transplantation of fishes and aquatic invertebrates in the U.S.S.R. in 1960-1961. Vop. ikht. 3 no.2:366-395 '63. (MIRA 16:7)
(Fish introduction) (Invertebrates)

KARPEVICH, A.F., DOROSHEV, S.I.

Premises to the acclimatization of valuable fishes and invertebrates in the sea basins of the U.S.S.R. Trudy VNIRO 55:9-28 '64.
(MIRA 18:4)

KARPEVICH, A.F.

Biological basis for the acclimatization of valuable species of fish in the Sea of Azov. Trudy VNIRO 55:47-61 '64.

Expediency of the acclimatization of the planktonic copepod Calanipeda aquae dulcis Kritsch in the Aral Sea. Ibid.:113-123 (MIRA 18:4)

KARPEVICH, A.F.; MIKHAYLOV, B.N.

Salinity and temperature requirements of the Pacific shrimp Pandalus latirostris Rathbun. Trudy VNIRO 55:185-191 '64.
(MIRA 18:4)

KARPEVICH, A.F.

Change in the productivity of the Sea of Azov following the regulation of streamflow; present state of the Sea of Azov. Gidrobiol. zhur. 1 no.2:3-14 '65.

(MIRA 18:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva.

KARPEVICH, A.F.

Change in the productivity of the Sea of Azov following regulation of the runoff of rivers. Gidrobiol. zhur. 1 no.3:3-12 '65.
(MIRA 18:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut morskogo rybnogo khozyaystva i okeanografii, Moskva.

KARPETYAN, K.A. (Yerevan, ul. Kirova, d. 21, kv. 24)

Neuroblast migration in human lingual nerves during embryogenesis [with summary in English]. Arkh.anat.gist. i embr. 35 no.6:63-70 N-D '58. (MIRA 12:1)

1. Iz laboratorii normal'noy i patologicheskoy morfologii nervnoy sistemy (zav. - prof. Yu. I. Zhabotinskiy) Otdela patologicheskoy anatomii (zav. - akademik N.N. Anichkov) Instituta eksperimental'noy meditsiny AMN SSSR I kafedry gistologii Yerevanskogo meditsinskogo instituta (zav. - dots. G.A. Yepremyan).

(TONGUE, innervation,
neuroblast migration during embryogenesis (Rus))

KARPEYEV, G. A., Cand Phys-Math Sci -- (diss) "Study of ~~xxxxxx~~ ~~xxxxx~~ statistical characteristics of amplitude fluctuations of the ultra-short waves of radio signals during diffusion on ~~the~~ ground-surface routes in the zone of direct visibility." Mos, 1957. 12 pp. (Mos Order of Lenin and Labor Red Banner State Univ im M. V. Lomonosov, Phys Faculty), 100 copies. (KL, 9-58, 112)

SEMENOV, A.A.;KARPEYEV, G.A.

Nature of the fast damping of a radio signal when it is propagated through a prism type course. Vest. Mosk. un. Ser. mat., mekh., astron. fiz., khim. 12 no. 6:69-85 '57. (MIRA 11:10)

1. Kafedra rasprostraneniya, izlucheniya i kanalizatsii elektromagnitnykh voln Moskovskogo gosudarstvennogo universiteta.
(Radio waves--Damping)

SEMENOV, A.A.; KARPEYEV, G.A.

Structural and correlation functions used for the study of stochastic physical processes. Izv. vys. ucheb. zav.; fiz. no.3:39-42 '58. (MIRA 11:9)

1. Moskovskiy ordena Lenina gosuniversitet imeni M.V. Lomonosova.
(Correlation (Statistics))

06489
SOV/141-58-4-5/26

AUTHORS: Semenov, A.A. and Karpeyev, G.A.

TITLE: An Estimate of the Statistical Characteristics of Fluctuation of a UHF Radio Signal when Propagated in a Statistically Non-Uniform Medium (Otsenka statisticheskikh kharakteristik flyuktuatsiy ukv radiosignala pri rasprostranenii v statisticheski neodnorodnoy srede)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1958, Nr 4, pp 52-62 (USSR)

ABSTRACT: A theoretical estimate is made of the errors incurred when continuously integrating over a finite interval of time and also when taking discrete samples for various forms of correlation function in the process under study. An estimate is made of the optimum integrating time and of the sample size for a given statistical accuracy. Experimental data are presented relating to propagation of a 9350 Mc/s signal over an overland route. Within the zone of direct visibility the strictly mathematical definition of a random process is that of Eq (1); experimental data yield only a time record

Card 1/5

An Estimate of the Statistical Characteristics of Fluctuation of a UHF Radio Signal when Propagated in a Statistically Non-Uniform Medium

and the appropriate parameters are those in Eq (2): the latter are the mean value, the dispersion and the auto-correlation coefficient. Let E(t) represent a stationary random process, then Eq (3) gives the dispersion of value and the mean square deviation is given in Eq (4). Knowing the dispersion in the ensemble and assuming a normal distribution we may find the probability that the function will deviate from the mean value within a given interval (Eq 6). From Eq (5) and (6) the statistical fluctuation in the function describing the process may be determined. Under the conditions which prevail with UHF propagation the signal varies fairly rapidly and integration may take place over a considerably longer time. Considerable simplifications may be introduced giving the approximate formulae of Eq (16). If the random process is described by n different values taken during an interval of time T

An Estimate of the Statistical Characteristics of Fluctuation of a UHF Radio Signal when Propagated in a Statistically Non-Uniform Medium

the statistical quantities are defined in Eq (18). It is obvious from this expression that only when the correlation coefficient is zero will the statistical properties be identical with those obtained from the theory of sampling. If the correlation coefficient is not zero then Eq (18) can give a significantly different result. If for example, the correlation coefficient increases monotonically, then by increasing the time T and the interval between samples but leaving the number of samples unchanged, the accuracy of the estimate increases until it approaches that obtained by the other method. In other words a sample of a certain size taken over a long time interval can give greater statistical accuracy than a larger sample taken over a shorter time. The conditions are determined from the optimum values of T and n in Eq (19). An experimental time record has been numerically integrated and Tables 1a and 1b show how the mean value and the mean square deviation depend

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-ampling intervals of
-econds. A total sampling interval

An Estimate of the Statistical Characteristics of Fluctuation of a UHF Radio Signal when Propagated in a Statistically Non-Uniform Medium

of 900 seconds is adequate since even if this interval is increased to 1 hour there is an insignificant improvement in the results. It is concluded that the accuracy with which the statistical parameters may be determined when using continuous integration depends on the averaging time and the correlation characteristics of the process. When the discrete sampling method is used, better results are obtained by using n uncorrelated values than by using the same number of samples within a shorter interval of time. There are 4 tables and 6 references, 5 of which are Soviet and 1 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 8th January 1958

~~9(9)~~ 9.9000

AUTHORS: Semenov, A.A., Karpeyev, G.A. SOV/155-58-4-26/34

TITLE: On the Connection Between the Fading Velocity of Radio Microwaves and the Drift of the Inhomogeneities of the Troposphere (O svyazi skorosti fedinga santimetrovykh radiovoln s dreyfom neodnorodnostey v troposfere)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 4, pp 155 - 160 (USSR)

ABSTRACT: After a short survey on the western research results on the considered domain the authors give results of measurements of the correlation coefficients between wind velocity and fluctuation frequency and between fluctuation frequencies for different carrier frequencies which have been carried out in October 1957 by the students O.I. Komarov and A.M. Karachun. According to the authors there exists a variable functional relation between the fluctuation- and the carrier frequency : Under strong wind the fluctuation frequency depends linearly on the carrier frequency, under calm, however, it varies only with the 2/3 power of the carrier frequency.

Card 1/2

4

SOV/139-58-6-19/29

AUTHORS: Semenov, A.A. and Karpeyev, G.A.

TITLE: On the Decay of the Field Amplitude of an Electromagnetic Wave Propagated in a Statistically Inhomogeneous Medium (O zamiranii amplitudy polya elektromagnitnoy volny, rasprostranyayushcheysya v statisticheski neodnorodnoy srede)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 6, pp 118-122 (USSR)

ABSTRACT: The authors discuss the relationship between statistical properties of a medium and the field amplitude of an electromagnetic wave propagated through that medium. It is shown that the decay of the field amplitude (its temporal correlation function) is determined not only by the correlation function of the fluctuations of the refractive index of the medium but it depends also on the geometry of the system and the radiation patterns of the transmitting and receiving aerials. Conditions of validity of Silverman's asymptotic solutions (Ref 1) are established. It is shown that for the nature of the field amplitude fluctuations to be independent of the mean e.m.flux

Card 1/2

On the Decay of the Field Amplitude of an Electromagnetic Wave Propagated in a Statistically Inhomogeneous Medium

velocity, it is sufficient for the normalised function of the correlation of the refractive index fluctuations to have the form $\rho(r,\tau) = \rho^1(r,\tau)\rho^{11}(r,\tau)$ where ρ is the refractive index, r is the vectorial distance and τ is time. The theory given in the paper can be applied to radio-wave propagation in the terrestrial atmosphere. The paper is entirely theoretical. There are 2 figures and 7 references of which 4 are Soviet, 2 English and 1 a translation from English into Russian.

ASSOCIATION: Moskovskiy Gosuniversitet imeni M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

SUBMITTED: 31st May 1958

Card 2/2

SOV/142-58-6-14/20

9(9)
AUTHORS: Semenov, A.A., and Karpeyev, G.A.

TITLE: On the Space-Time Correlation of Fluctuations in Amplitude of the Field of an Electromagnetic Wave Passing Through a Statistically Non-Homogenous Medium (O prostranstvenno-vremennoy korrelyatsii flyuktuatsiy amplitudy polya elektromagnitnoy volny, proshedshey cherez statisticheski neodnorodnuyu sredu)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr 6, pp 724-730 (USSR)

ABSTRACT: The authors present the results of a theoretical and experimental investigation of the speed of fading as a function of the averaged flux velocity and the carrier frequency of the radiation being studied. The article also includes a theoretical evaluation of the relation between the space-time correlation of the fluctuations in the field of an electromagnetic wave and fluctuations in the dielectric constant of the medium. In 1955-1957,

Card 1/6

2 series of fluctuations [Refs 3,4]. The 1955-1956 series was performed on two land lines of 15, and 36 km, respectively. A pulse generator, operating at 9350 mc, with a pulse duration of 1 M/sec, a pulse repetition rate of 557 cps, and a pulse power of 65 kw was used. The receivers were superhets with a sensitivity of 90 db/mW. Paraboloid antennae with a diameter of 0.7 m were used for both transmission and reception. Statistical characteristics of field amplitude, and their connection with characteristics of the medium - particularly wind velocity along the land lines - were studied in this, as in the following series. In 1957 series was conducted on a land line of 36 km, and attention was directed to study of the relation of the character of field fluctuations to the dynamic state of the medium, and to the carrier frequency of the

Card 2/6

On the Space-Time Correlation of Fluctuations in Amplitude of the Field of an Electromagnetic Wave, Passing Through a Statistically Non-Homogenous Medium

radiation. Two transmitters were used, one at 3000 mc with pulse duration of 1 M/sec, p.r.r. of 400 cps, and pulse power of 80 kw, the other at 9390 mc, with 0.45 M/sec pulses, p.r.r. of 1200 cps, and a power of 88 kw. Receivers were similar to the above. Parabolic antennae with 3 deg (9390 mc), and 18 deg (3000 mc) directivity patterns were used. Measurements were made by the radio-location method. Fluctuations in the amplitude of field, reflected from stable reflectors at one end of the land line, were studied. The authors describe the study of the relation of the speed of fading to 1) the averaged velocity of flux, and 2) the carrier frequency. The following conclusions are offered: The space-time correlation of the field of an electromagnetic wave, passing through a statistically non-homogenous medium, has special

On the Space-Time Correlation of Fluctuations in Amplitude of the Field of an Electromagnetic Wave Passing Through a Statistically Non-Homogenous Medium

anisotropy even under isotropic conditions of the special function of the correlation of the fluctuations of the dielectric constant of the medium; the speed of fading, defined as the number of nulls of the centred field amplitude, increases with an increase in wind velocity along the line, however, this relation cannot be presented as a linear function, save under express conditions (q.v.); speed of fading increases with carrier frequency, generally speaking; investigation of the functional relation of the ratio of the speeds of fading for the two frequencies f_1=3000 mc, and f_2=9390 mc showed, that with an increase in wind velocity (V) along the line this ratio decreases, and at V = 4-5 meters/sec approaches a steady state value near f_2/f_1 over an averaging time interval of 15 min., and a value near $(f_2/f_1)^{2/3}$ over an averaging time

On the Space-Time Correlation of Fluctuations in Amplitude of the Field of an Electromagnetic Wave Passing Through a Statistically Non-Homogenous Medium

interval of 50 sec.; the speed of fading, defined as the result of the statistical analysis of the recording in time of the field amplitude, is a function of averaging time, and decreases with an increase in the latter, attaining a steady state value over an averaging time interval of 6-9 min.; speed of fading may not be presented as the product of two functions, one of which is a function of wind velocity, the other of the carrier frequency, as hitherto believed. This article was recommended by the Kafedra rasprostraneniya, izlucheniya i kanalizatsii radiovoln Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova (Chair of Propagation, Radiation, and Channeling of Radio Waves of the Moscow State

6(4)

AUTHORS: Semenov, A.A., Karpeyev, C.A. SOV/55-58-2-10/35

TITLE: An Investigation of the Methods of Measurement of Antenna Impedance in Order to Characterize the Electric Parameters of the Medium (Issledovaniye metodiki izmereniya antennykh impedansov dlya kharakteristiki elektricheskikh parametrov sredy)

PERIODICAL: Vestnik Moskovskogo Universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, V. 13 1958, Nr 2, pp 77-84 (USSR)

ABSTRACT: The authors describe a special instrument for the measurement of the antenna resistance. The instrument was installed on a helicopter. The input resistance of the antenna was measured during the flight over a ground plane with variable electric characteristic values. To sudden variations of the ground parameters there corresponded sudden variations of the resistance. Some measurements were carried out by T.P. Flerova. The authors thank Professor A.N. Tikhonov for his assistance.
There are 7 figures, and 13 references, 4 of which are Soviet, 3 Irish, 5 American, and 1 Canadian.

ASSOCIATION: Kafedra rasprostraneniya, izlucheniya i kanalizatsii radiovoln [Moscow Univ.]

Card 1/2

An Investigation of the Methods of Measurement of Antenna Impedance in Order to Characterize the Electric Parameters of the Medium SOV/55-58-2-10/35

(Chair of Propagation, Emission and Channeling of Radio Waves)

SUBMITTED: January 16, 1957

Card 2/2

9(9), 16(1)

AUTHORS: Semenov, A.A., and Karpeyev, G.A. SOV/55-58-4-8/31

TITLE: Estimation of the Statistical Characteristics of the Fluctuations of an Ultra Short Wave - Radio Signal During Propagation in a Statistically Inhomogeneous Medium (Otsenka statisticheskikh kharakteristik fluktuatsiy UKV radiosignala pri rasprostranenii v statisticheski neodnorodnoy srede)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 4, pp 71-84 (USSR)

ABSTRACT: An ultra short wave - radio signal is understood as a stationary random process. The normal distribution of the logarithm of the amplitude is assumed. Under some further assumptions the authors determine mean values, mean quadratic deviations, correlation coefficients etc. The performed statistical estimations agree well with the experimental results. During the evaluation of the results of measuring it was examined whether the assumption is justified that the propagation of the ultra-short wave - radio signal is a stationary random process; the admissibility of the assumption was confirmed.
There are 5 tables, and 3 Soviet references.

ASSOCIATION: Kafedra rasprostraneniya, izlucheniya i kanalizatsii radiovoln (Chair of Propagation, Emission, and Canalization of Radio Waves)

SUBMITTED: July 3, 1957

Card 1/1

SOV/109-59-4-2-5/27

AUTHORS: Semenov, A.A., and Karpeyev, G.A.

TITLE: Investigation of the Properties of the Rapid Fadings of Radio Signals Propagating over Medium-Distance Near-Ground Paths (Issledovaniye kharaktera bystrykh zamiraniy radiosignalov na prizemnykh trassakh sredney protyazhennosti)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2, pp 187-194 (USSR)

ABSTRACT: During the period December 1955 - March 1956, the Chair of the Radiowave Propagation of the Physics Department of the Moscow University carried out the investigations on the propagation of radio signals over ground paths in the zone of direct visibility. The propagation paths were situated over a locality whose profile is illustrated in Fig (1); large regions of this area were covered with a dense forest. The transmitter employed in the measurements operated at the wavelength of 3 cm and had a pulse power of 65 kW. A parabolic antenna, having the main beam of 2.7° and a horizontal polarization, was used. The amplitudes of two standard signals reflected

Card 1/3

Investigation of the Properties of the Rapid Fadings of Radio Signals Propagating over Medium-Distance Near-Ground Paths

from two reflectors situated at distances of 15 and 36 km from the transmitter were investigated. The signals were received by two receivers situated at a certain distance apart. The sensitivity of the receivers was 90 db with respect to 1 mW. The receivers were normally spaced vertically at a distance of 30 m and the receiving antennae were similar to the transmitting antenna. The amplitudes of the reflected signals were recorded on a photographic film; this was subsequently subjected to a statistical analysis. Some of the recorded signal samples are shown in Fig.(3). The results of the analysis of the measured data are given in Fig (4) and (5). Fig (4) gives a comparison of the distribution laws for the probabilities of the signal amplitudes for various wind velocities at the point of reception. The graphs of Fig (5) show the relative spread of the signal amplitude for four recording channels and for the average wind velocity over the period from 15th December 1955 - 10th March 1956; curves I and II relate to the reflector situated at a

Investigation of the Properties of the Rapid Fadings of Radio Signals Propagating over Medium-Distance Near-Ground Paths

distance of 15 km, while curves III and IV are for the reflector situated at a distance of 36 km. The correlation functions for the two signals were also determined, but it was found that for the receiver spacing of 30 m, the correlation coefficients were very small (of the order of 0.2). There are 5 figures (1 plate) and 12 references of which 7 are Soviet and 5 English; 2 of the Soviet references being translated from English.

ASSOCIATION: Fizicheskiy Fakul'tet Moskovskogo Gosudarstvennogo Universiteta im.M.V.Lomonosova (Physics Department of the Moscow University imeni M.V.Lomonosov)

SUBMITTED: 2nd April 1957

Card 3/3

69784

S/055/59/000/06/10/027
B006/B005

9.9100

AUTHOR: Karpeyev, G. A.

TITLE: On a Class of Unsteady Random Functions Which May Be Converted to Steady Ones

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, No. 6, pp. 106 - 111

TEXT: In view of the great importance of statistical methods in radiophysics, a number of investigations on propagation laws and characteristics of random processes have been carried out, particularly in connection with investigations of ionospheric inhomogeneities. An investigation of the propagation of ultrashort waves considering the dispersion in the troposphere would be impossible without statistical methods. A peculiarity of these problems is the impossibility of obtaining the characteristics of random processes which prove to be the sum of almost regular and steady random functions. The problem of converting unsteady to steady functions has been solved (Ref. 4), but there are a number of difficulties in practice; they are mainly due to the circumstance that an estimation of the statistical characteristics of the process yields only one

Card 1/2

4

On a Class of Unsteady Random Functions Which May Be Converted to Steady Ones

S/055/59/000/06/10/027
B006/B005

of its possible realizations. The present paper deals with a method of analyzing a sufficiently numerous class of unsteady random functions, and presents a statistical estimation of the statistical characteristics of their steady fractions. The random function $X(t) = \varphi(t) + x(t)$ is considered where $\varphi(t)$ is a regular function of its argument, $x(t)$ describes the steady random process, $\varphi(t_o+t) = -\varphi(t_o-t)$ where t_o can be put equal to zero without restriction of the generality. A random function $\xi(t)$ is determined in such a manner that $\xi(t) = X(t) + X(-t)$, i.e. $\xi(t) = x_1(t) + x_2(t)$, with $x_1(t) = x(t)$ and $x_2(t) = x(-t)$, so that $\xi(t) = +\xi(-t)$. Thus, the random function $\xi(t)$ is a sum of normally propagating random functions for which the propagation law is given. Now, the characteristic of $\xi(t)$ is investigated (which is described by the equation system (23)), and it is shown that the characteristics of the process $x(t)$ can be estimated if the propagation law is known. No restrictions have to be imposed on the spectra of the random component $x(t)$ and of the regular component $\varphi(t)$ of the process. There are 6 Soviet references.

ASSOCIATION: Kafedra rasprostraneniya radiovoln (Chair of Propagation of Radio Waves)

SUBMITTED: March 19, 1959

Card 2/2

S/055/59/000/06/14/027
B006/B005

AUTHORS: Semenov, A. A., Karpeyev, G. A.

TITLE: On the Relation Between the Fading Frequency of the Ultrashort-wave Field Amplitude and the Drift Velocity of Inhomogeneities in the Troposphere and the Carrier Frequency

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, No. 6, pp. 131 - 136

TEXT: At first, it is investigated theoretically inhowfar the dynamic parameters of the troposphere can be determined by an investigation of the fading of radio signals and by a study of dynamics of the troposphere by means of fluctuation characteristics of signals. To estimate theoretically the influence of regular drift and chaotic motion of inhomogeneities, an expression is written down - on the basis of the classical model of radio-wave dispersion in the troposphere - for the space-time correlation function (1) of the complex field amplitude in two points, a moving coordinate system is introduced, and an equation is formulated for the correlation coefficient of the complex field amplitude $\varrho_0(\tau)$ in this coordinate system. This equation is further transformed (Fourier trans-

Card 1/2

formation), and finally the correlation function is written down in moving coordinates. (Initial equations and symbols are taken from Ref. 1.) In the second part of the paper, theoretical results are compared with experimental data; there are, however, too few experimental data to find a dependence of fluctuation frequency on drift velocity and carrier frequency. Fig. 2 shows the fluctuation rate at 9390 and 3000 Mc/sec as a function of wind velocity; Fig. 3 shows measurement data of the radius of autocorrelation of the field amplitude of the signal (9390 Mc/sec) reflected by a standard reflector on the 36-km line, and the course of wind velocity. Fig. 4 presents measurement results of the correlation coefficient of the reflected field (3000 Mc/sec) for the wind velocities 5m/sec and 2m/sec. Formula (10) can be set up for a simple model from the scarce experimental data on the dependence of the fading rate on the carrier frequency. Fig. 5 shows the corresponding distribution of measured values, and the data taken from Ref. 6. There are 5 figures and 7 references, 5 of which are Soviet.

ASSOCIATION: Kafedra rasprostraneniya radiovoln (Chair of Propagation of Radio Waves)

SUBMITTED: April 11, 1959

BENDRIKOV, G.A.; KRASNUSHKIN, P.Ye.; REYKHRUDEL', E.M.; POTEMKIN, V.V.; MUSTEL', Ye.R.; RZHEVKIN, K.S.; IVANOV, I.V.; KHARLAMOV, A.A.; TIKHONOV, Yu.V.; STRELKOVA, L.P.; KAPTSOV, L.N.; ORDANOVICH, A.Ye.; KHOKHLOV, R.V.; VORONIN, E.S.; BERESTOVSKIY, G.N.; KRASNOPEVTSEV, Yu.V.; MINAKOVA, I.I.; YASTREBTSEVA, T.N.; SEMENOV, A.A.; VINOGRADOVA, M.B.; KARPEYEV, G.A.; DRACHEV, L.A.; TROFIMOVA, N.B.; SIZOV, V.P.; RZHEVKIN, S.N.; VELIZHANINA, K.A.; NESTEROV, V.S.; SPIVAK, G.V., red.; NOSYREVA, I.A., red.; GEORGIYEVA, G.I., tekhn. red.

[Special physics practicum] Spetsial'nyi fizicheskii praktikum. Moskva, Izd-vo Mosk.univ. Vol.1. [Radio physics and electronics] Radiofizika i elektronika. Sost. pod red. G.V.Spivaka. 1960. 600 p.

(MIRA 13:6)

1. Professorsko-prepodavatel'skiy kollektiv fizicheskogo fakul'teta Moskovskogo universiteta im. M.V.Lomonosova (for all except Spivak, Nosyreva, Georgiyeva).

(Radio) (Electronics)

69894

S/109/60/005/04/007/028
E140/E435

9.9000

AUTHORS: Karpeyev, G.A. and Semenov, A.A.

TITLE: An Experimental Method for the Study of UHF Fluctuations

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4, pp 578-583 (USSR)

ABSTRACT: The purpose of the present work is to substantiate the interference method of measuring UHF fluctuations. The results of measurements by this method have been interpreted as phase fluctuations of the wave by Deam and Fannin (Ref 3) but this is not always correct. It is shown that if the signal at the input to the antenna system can be represented by the sum of a random and a regular field component, the output voltage variation will be determined by the amplitude-phase variations of the input field and will depend on the regular field component and the length of the base. There are 1 figure and 7 references, 3 of which are Soviet and 4 English.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V.Lomonosova (Physics Department,

Card 1/2

69894

S/109/60/005/04/007/028
E140/E435

An Experimental Method for the Study of UHF Fluctuations

Moscow State University imeni M.V.Lomonosov)

SUBMITTED: April 23, 1959

Card 2/2

24935

S/188/61/000/004/001/003
B111/B209

9.9816
6.4300

AUTHORS: Semenov, A. A., Karpeyev, G. A., Kubasov, P. Ye., Filipp, N. D.

TITLE: Investigation of the spatial correlation properties of the amplitude fluctuations in a USW field

PERIODICAL: Moskovskiy Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 4, 1961, 14-21

TEXT: The authors present the results of experimental measurements; they estimate the radii of the spatial coordinates and compare the spatial correlations of the field amplitude fluctuations with the temporal ones. The experimental setup was as follows: At one end of a 37-km long terrace two pulse emitters were mounted, the one displaying a power of 80 kw at a frequency of 3,000 Mc, operating with a repetition rate of 400 cps and a pulse length of 1 μ sec; the data of the second emitter are 65 kw, 9370 Mc, 577 cps, and 1 μ sec. The antennas were accomplished as parabolic rotary aerials having a diameter of 1.8 m and 0.7 m, respectively. The receivers were placed at the other end of the terrace and had two similar channels for each of the two frequencies. Each of the channels was a superheterodyne

Card 1/5

receiver with a band width of 3 Mc and a sensitivity of 3 db per 1 mw for f = 3,000 Mc, and of 70 db for f = 9,370 Mc. The distance of the receiver aerials was varied between 10 and 550 cm for λ = 10 cm and between 4 and 200 cm for λ = 3.2 cm. The fluctuations were divided into 1) slow and low fading, 2) relatively slow fading, and 3) quick fluctuations. Fig. 2 essentially shows the dependence of the fluctuation spectrum of a USW amplitude on the wind velocity on the terrace. The transverse correlations of the amplitude fluctuations in a horizontal plane were also studied. The records were taken at two points on a line perpendicular to the wave propagation. The results as shown in Fig. 3 correspond to an enhanced refraction and to a wind velocity of $v \approx 1$ m/sec. It can be concluded from the results that the character of the spatial amplitude correlations depends not only on the conditions in the medium but also on the frequency. Moreover, the authors found that the radius of the transverse correlations of quick fluctuations on earth terraces after some tens of kilometers does not exceed the length of 50-60 λ in the case of normal refraction. In fluctuation studies in a turbulent medium, the following turbulence model is usually employed: $\vec{v} = \vec{v}_0 + \vec{v}_1$, where $\vec{v}_0$ denotes the mean flow velocity,

Investigation of the spatial ...

$\vec{v}_1$ the turbulent velocity (Ref. 10: Chernov, L. A., Rasprostraneniye voln v srede so sluchaynymi neodnorodnostyami - Wave propagation in a medium with incidental heterogeneities, Izd-vo AS SSSR, M., 1958). For a considerable number of experiments, the temporal correlation $Q(\tau)$ may be written as $Q = \exp(-\tau/a)$, where a has to be determined by experiment. An analogous expression holds for the spatial correlations $Q(l)$. The authors point out the fact that, in the case of slow wind velocities $v < 1$m/sec and enhanced refractions, the experimental curves are near those expected. When turbulence is great, not only the effect of regular drift but also that of chaotic motion in the atmosphere has to be taken into account in the formation of fluctuations. Investigations at the horizon showed that l_0, for which $Q(l_0) = 0.5$, always has the same order of magnitude. There are 6 figures and 10 references: 8 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Kafedra rasprostraneniya radiovoln (Department of Radiowave Propagation)

SUBMITTED: May 26, 1960 (initially)
May 25, 1961 (after revision)

Card 3/5

24936
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B111/B209

9.9816

Semenov, A. A., Karpeyev, G. A., Filipp, N. D.

TITLE: Some peculiarities of USW-signal fluctuations in the conditions of propagation on a low-altitude terrace in the range of direct vision

PERIODICAL: Moskovskiy Universitet. Vestnik. Seriya III: Fizika, astronomiya, no. 4, 1961, 22-29

TEXT: The results of experimental investigations of the statistical characteristics of the USW-field amplitude fluctuations under the conditions of multi-beam emission are presented. Moreover, the authors show the dependence of the spatial correlations of the amplitude fluctuations on the patel-shaped structure of the field at the point of reception. It was the aim of this paper to demonstrate the effect of a non-regular interface upon the quantity and the spatial propagation of the characteristics of fluctuation. A simple estimate of the fluctuations of multi-beam USW waves is given in the approximation of geometrical optics. In this connection it is stated that the mean square amplitude and its mean square fluc-

Card 1/4

Some peculiarities of USW-signal ...

tuations depend on the difference in the paths of direct and reflected beams. In section 2 of the paper, an expression for the spatial correlation of the amplitude fluctuations is derived exactly and is then simplified on the following assumptions: 1) Both receiver aerials are in the vicinity of the interference maxima or minima of the field, 2) $\Delta E_i/E_i \ll 1$, $\Delta\varphi_i \ll 1$, where ΔE_i, $\Delta\varphi_i$ indicate the fluctuations of amplitude and phase respectively, 3) ΔE_i and $\Delta\varphi_i$ are distributed according to the normal law, 4) $4L/ka^2 \gg 1$, and 5) direct and reflected waves do not interfere with each other. Hence it followed, that the spatial amplitude correlations of the received signals have a patel-shaped character when an interface exists. Expressions for the spatial correlations $\varrho(P_1P_2)$ have been derived for several special cases. When the fourth-order terms of the spatial correlation functions are omitted (which is permissible in the vicinity of the interference extrema except the minimum with $R \simeq 1$), the spatial propagation of the time correlations of the amplitude fluctuations at the output of the receiver will not be patel-shaped and will coincide with the correlation of the fluctuations in free space. When the interface is inhomo-

Card 2/4